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Hospitalizations for Spinal Cord Injuries, 1994-1998

Jay S. Buechner, PhD, Mary C. Speare, MA, and Janice Fontes, MA

Injuries to the spinal cord are relatively rare, but can be serious and debilitating, as they often result in death or lifelong paraplegia or quadriplegia. Because of their cost to society in terms of medical care and lost productivity, because of the suffering experienced by victims, and because of the emotional toll they inflict on families and friends of victims, spinal cord injuries (SCIs) are high priorities for injury prevention programs.

Nearly every person who suffers a SCI and survives the initial trauma is admitted to an acute care hospital. Thus, hospitalizations for SCI serve as an acceptable proxy for the incidence of non-fatal SCI. The following analysis presents data from Rhode Island hospitals on discharges with SCI and related diagnoses.

Methods. Hospitalizations with SCI and related diagnoses were identified from hospital discharge data for Rhode Island acute care hospitals using the Centers for Disease Control and Prevention's (CDC) case definition for spinal cord injuries.[1] For use with hospital discharge data, the CDC case definition has been translated into two lists of disease codes, those identifying discharges that can be presumed to be cases of spinal cord injury ("cases") injury and those identifying other discharges that may prove to be cases after inspection of the medical record ("possible cases"). (Table 1) Information on the patient's age, sex, and discharge status and on the cause of injury (e.g., fall, motor vehicle crash) were obtained from the discharge database. Discharges from October 1, 1993, through September 1, 1998, corresponding to hospital fiscal years 1994 -1998, were included in the analysis. Age-specific rates were computed using state population estimates for 1994 through 1998 from the federal Bureau of the Census.[2]

Results. During the five-year period studied, there were 277 discharges from Rhode Island hospitals with a principal or additional diagnosis of SCI, an average of 55 per year, and another 2,002 discharges with possible SCI, an average of 400 per year. (Table 1) Of the possible cases, the large majority were fractures of the vertebral column with no mention of accompanying SCI. Other possible cases included discharges for late effects of SCI or fractures of the spine, presumably representing re-admissions sometime after the initial treatment at time of injury. Reviews of the medical records of a sample of possible cases have revealed that very few are true SCI cases, so all results hereafter are based only on discharges with a principal or additional diagnosis of SCI.

The rates of hospitalization for SCI, based on the CDC definition for cases, varied by age from 0.9 per 100,000 population among persons ages 0-14 years to 9.9 per 100,000 among persons ages 65 and older, with an intermediate peak among persons ages 15 -24 years. (Figure 1) Males comprised two-thirds of SCI cases overall and experienced higher hospitalization rates in each age group. Among persons under age 45, hospitalization rates for males were typically three times the rates for females, and among those ages 65 and older, the rates for males were higher than rates for females by 60% or more.

The largest number of SCIs were caused by falls, followed by motor vehicle crashes. Other causes were relatively minor contributors, including assaults (5%) and self-inflicted injuries (1%). (Figure 2) Among the elderly, falls caused over half (58%) of all SCIs and motor vehicle crashes only 14%. Among those

Table 1. Hospital Discharges with Spinal Cord Injury (SCI) and Possible SCI, by Diagnosis, Rhode Island, October 1, 1993 - September 30, 1998

Diagnosis	Discharges Number	Percent
SCI Cases	***277***	***12.2***
Fracture of vertebral column with spinal cord injury	131	5.7
Spinal cord injury without evidence of spinal bone injury	146	6.4
Possible SCI Cases	***2002***	***87.8***
Fracture of vertebral column without mention of spinal cord injury	1652	72 .5
Late effect of spinal cord injury	176	7.7
Injury to nerve roots and spinal plexus	32	1.4
Late effect of fracture of spine and trunk without mention of spinal cord lesion	134	5.9
Late effect of injury to nerve root, spinal plexus, and other nerves of trunk	8	0.3
Total	***2279***	***100.0***

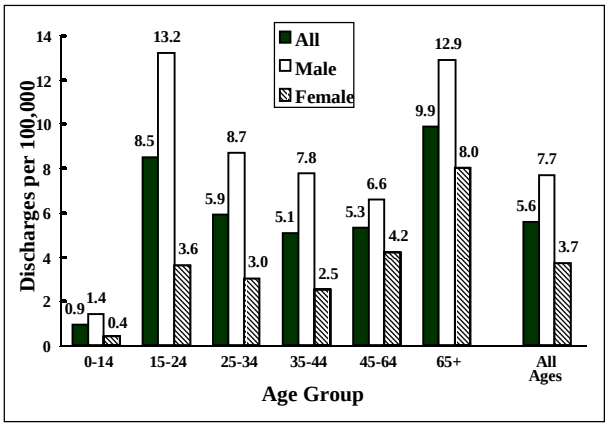

Figure 1. Hospitalizations per 100,000 Population with Any Diagnosis of Spinal Cord Injury, by Age Group and Sex, Rhode Island, Fiscal 1994-1998 (Annual Average)

ages 15-24, the pattern was reversed, with fewer SCIs caused by falls (28%) than by motor vehicles (38%).

Of those treated for SCIs, only one-third were discharged to home without some provision for ongoing care. (Figure 3) Of those receiving additional care, the largest number were transferred to a non-acute inpatient institution, presumably a rehabilitation facility (30%). Smaller proportions were discharged to home health care (16%), nursing homes (8%), or other acute-care hospitals (3%). Eight percent of SCI admissions died in the hospital.

Discussion. Injuries to the central nervous system, which include spinal cord injuries and the more numerous traumatic brain injuries, have been designated by the National Center for Injury Prevention and Control, CDC, as a high-priority focus for public health injury programs. In Rhode Island, the General Assembly originally mandated the reporting of traumatic brain injuries (TBI) to a central registry in 1987. Under the legislation, hospitals were required to report any discharge with a head injury diagnosis to the Office of Vocational Rehabilitation, Department of Human Services, for the purpose of helping persons with brain injuries gain access to appropriate medical and social services. In 1997 the legislation was amended to transfer responsibility for the registry to the Department of Health and to expand mandated reporting to include spinal cord injuries. In the same year, CDC funded the Department to develop a brain injury surveillance system based on the Traumatic Brain Injury Registry and the statewide hospital discharge data.

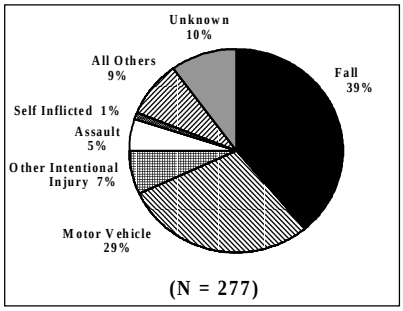

Figure 2. Cause of Injury for Hospitalizations with Any Diagnosis of Spinal Cord Injury, Rhode Island, Fiscal 1994-1998

In response to the legislative mandate, the Department of Health is preparing regulations that will establish the reporting requirements for spinal cord injuries. In addition, CDC funding is helping develop an associated SCI surveillance system. These information resources will help persons with SCI and will support SCI prevention programs, just as the TBI Registry and surveillance system have served persons with brain injuries and programs addressing TBI prevention.

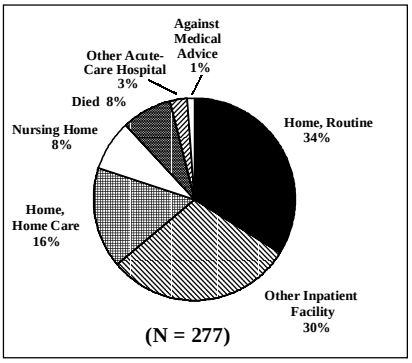

Figure 3. Discharge Disposition for Hospitalizations with Any Diagnosis of Spinal Cord Injury, Rhode Island, Fiscal 1994-1998

Jay S. Buechner, PhD, is Chief, Office of Health Statistics, and Assistant Professor of Community Health, Brown University School of Medicine. Mary Speare, MA, is Traumatic Brain Injury Surveillance Coordinator, Division of Family Health. Janice Fontes, MA, is Principal Systems Analyst, Office of Health Statistics.

References

[1]Thurman DJ, Sniezek JE, Johnson D, et al. Guidelines for Surveillance of Central Nervous System Injury. Atlanta: Centers for Disease Control and Prevention, 1995.

[2]U.S. Bureau of the Census web site: www.census.gov/population/estimates/state/5age9890.txt.

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For more information, contact:
Rhode Island Department of Health
Office of Health Statistics
3 Capitol Hill
Providence, Rhode Island 02908
telephone 401 222-2550